

WHAT IS CLAIMED IS:

1                   1. A wireless receiver for receiving data over a wireless channel, comprising:  
2                   a plurality of antennas having signal diversity such that what is received from the  
3                   wireless channel is not identical at each of the plurality of antennas;  
4                   digital signal processing logic for processing signals received by the plurality of  
5                   antennas, wherein the signals are one or more of Barker modulated signals and  
6                   complementary code keying (CCK) signals;  
7                   demodulation logic in the digital signal processing logic that demodulates signals from  
8                   two or more of the plurality of antennas, including one or more of a Barker  
9                   correlator and a CCK correlator corresponding to modulation of the signals; and  
10                  distortion compensation in the digital signal processing logic that processes at least a  
11                  portion of the signals received to compensate for channel distortion.

1                   2. The wireless receiver of claim 1, wherein the demodulation logic comprises  
2                   a Barker demodulator comprising a Barker correlator and a Barker slicer.

1                   3. The wireless receiver of claim 1, wherein the demodulation logic comprises  
2                   a CCK demodulator comprising a CCK correlator and a CCK slicer.

1                   4. The wireless receiver of claim 1, further comprising a mean-square error  
2                   equalizer.

1                   5. The wireless receiver of claim 1, further comprising a decision feedback  
2                   equalizer.

1                   6. The wireless receiver of claim 1, further comprising:  
2                   a whitened-matched filter that receives one or more of the signals received by the  
3                   plurality of antennas and outputs a number of filtered signals, wherein the  
4                   whitened-matched filter operates on the one or more of the signals according to a  
5                   channel matched filter and a whitening filter.

1                   7. The wireless receiver of claim 6, further comprising:  
2                   a feedback filter; and

3 a symbol-by-symbol minimum distance receiver (SbS MDR) that receives the number of  
4 filtered signals from the sum of the whitened-matched filter and the feedback filter  
5 and outputs a resulting data stream.

1 8. The wireless receiver of claim 7, wherein the SbS MDR comprises:  
2 an SbS MDR matched filter, matched to a response of the whitened-matched filter and  
3 the wireless channel;  
4 a correlator; and  
5 a slicer.

1 9. The wireless receiver of claim 8, comprising a combined filter  
2 implementing the SbS MDR matched filter and the whitening filter.

1 10. The wireless receiver of claim 8, comprising a combined filter  
2 implementing the SbS MDR matched filter and the feedback filter.

1 11. The wireless receiver of claim 8, with corrections prior to slicing.

1 12. The wireless receiver of claim 11, comprising a combined filter  
2 implementing the SbS MDR matched filter and the whitening filter.

1 13. The wireless receiver of claim 11, comprising a combined filter  
2 implementing the SbS MDR matched filter and the feedback filter.

1 14. A wireless receiver for receiving data over a wireless channel,  
2 comprising:

3 a whitened-matched filter that receives one or more input signals received from the  
4 wireless channel and outputs a number of filtered signals, wherein the  
5 whitened-matched filter operates on the one or more input signals according to a  
6 channel matched filter and a whitening filter; and  
7 a symbol-by-symbol minimum distance receiver (SbS MDR) that receives the number of  
8 filtered signals from the whitened-matched filter and outputs a resulting data stream.

1 15. The wireless receiver of claim 14, wherein the one or more input signals  
2 is two or more input signals.

- 1                    16. The wireless receiver of claim 14, wherein the one or more input signals  
2 received is different than the number of filtered signals output.
- 1                    17. The wireless receiver of claim 14, further comprising a Barker  
2 demodulator.
- 1                    18. The wireless receiver of claim 14, further comprising a complimentary  
2 code keying demodulator.
- 1                    19. The wireless receiver of claim 14, further comprising a decision feedback  
2 equalizer.
- 1                    20. The wireless receiver of claim 14, wherein the SbS MDR comprises:  
2 an SbS MDR matched filter, matched to a response of the whitened-matched filter and  
3 the wireless channel;  
4 a correlator; and  
5 a slicer.
- 1                    21. The wireless receiver of claim 20, comprising a combined filter  
2 implementing the SbS MDR matched filter and the whitening filter.
- 1                    22. The wireless receiver of claim 20, comprising a combined filter  
2 implementing the SbS MDR matched filter and a feedback filter.
- 1                    23. The wireless receiver of claim 20, with corrections prior to slicing.
- 1                    24. The wireless receiver of claim 23, comprising a combined filter  
2 implementing the SbS MDR matched filter and the whitening filter.
- 1                    25. The wireless receiver of claim 23, comprising a combined filter  
2 implementing the SbS MDR matched filter and a feedback filter.
- 1                    26. The wireless receiver of claim 14, wherein the channel matched filter is  
2 implemented as a filter distinct from the SbS MDR matched filter and the whitening filter.
- 1                    27. A wireless receiver for receiving data over a wireless channel,  
2 comprising:  
3 a channel matched filter;

4 a first combined filter coupled with an input to receive an output of the channel matched  
5 filter, wherein the first combined filter operates according to an SbS MDR matched  
6 filter and a whitening filter;  
7 a correlator, coupled to receive an output of the first combined filter added to a feedback  
8 signal;  
9 a slicer, coupled to receive an output of the correlator added to one or more weights;  
10 a second combined filter coupled to receive a slicer output, wherein the second combined  
11 filter outputs the feedback signal and operates according to the SbS MDR matched  
12 filter and a feedback filter; and  
13 a data output for outputting a resulting data stream from an output of the slicer.

1 28. A wireless receiver for receiving data over a wireless channel,  
2 comprising:  
3 a plurality of antennas for receiving a plurality of signals from the wireless channel;  
4 a symbol-by-symbol minimum distance receiver (SbS MDR);  
5 a first combined filter having a transfer function that is a combination of a channel  
6 matched filter and an SbS MDR matched filter, wherein the channel matched filter is  
7 matched to a channel response of the wireless channel and the SbS MDR matched  
8 filter is matched to the SbS MDR, the first combined filter coupled to provide one or  
9 more filtered outputs to the SbS MDR; and  
10 a second combined filter that combines a transfer function of the SbS MDR matched  
11 filter with a feedback filter that receives an output of the SbS MDR and feeds back a  
12 signal to be combined with the one or more filtered outputs at an input of the SbS  
13 MDR.

1 29. The wireless receiver of claim 28, wherein the SbS MDR comprises:  
2 a correlator;  
3 means for weighting signals prior to slicing; and  
4 a slicer that slices weighted signals from the correlator.

1 30. The wireless receiver of claim 28, wherein the first combined filter further  
2 comprises a whitening filter transfer function.

1 31. A wireless receiver for receiving data over a wireless channel,  
2 comprising:

3 one or more antennas for receiving one or more signals from the wireless channel;  
4 a symbol-by-symbol minimum distance receiver (SbS MDR);  
5 a first combined filter having a transfer function that is a combination of a channel  
6 matched filter, a whitening filter and an SbS MDR matched filter, wherein the  
7 channel matched filter is matched to a channel response of the wireless channel and  
8 the SbS MDR matched filter is matched to the SbS MDR, the first combined filter  
9 coupled to provide one or more filtered outputs to the SbS MDR; and  
10 a second combined filter that combines a transfer function of the SbS MDR matched  
11 filter with a feedback filter that receives an output of the SbS MDR and feeds back a  
12 signal to be combined with the one or more filtered outputs at an input to the SbS of  
13 MDR.

1 32. The wireless receiver of claim 31, wherein the SbS MDR comprises:  
2 a correlator;  
3 means for weighting signals prior to slicing; and  
4 a slicer that slices weighted signals from the correlator.